

Tubakia Leaf Spot of Chestnut¹

N. E. El-Gholl², T. S. Schubert², and M. E. Peacock³

INTRODUCTION: Chestnuts (*Castanea* spp.) are attractive drought-tolerant trees grown for timber and their nuts, which are eaten roasted or candied (Huxley 1992). The genus *Castanea* (family Fagaceae) consists of twelve species which are native to temperate parts of North America, Europe, and Asia (Everett 1981). Because of a devastating blight disease of the American chestnut [*Castanea dentata* (Marshall) Borkh.], caused by the fungus *Cryphonectria parasitica* (Murrill) Ban [syn. *Endothia parasitica* (Murrill) P. J. Anderson & H. W. Anderson], the US Forest Service and Dr. R. A. Joyner (Connecticut Agricultural Experiment Station) have produced hybrids of *C. dentata* with the blight-resistant Chinese chestnut *C. mollissima* Blume, and the nearly resistant Japanese chestnut, *C. crenata* Sieb. & Zucc. (Everett 1981; Huxley 1992). Dr. R. T. Dunstan, a well-known plant breeder in Greensboro, N. C., developed his own hybrid of *C. dentata* with *C. mollissima*. This hybrid is produced and marketed nationwide. The first cross was made in 1953 and the breeding process took ten years to develop a hybrid with very large nuts (15-35/lb.) and excellent timber (Wallace 1994). Dunstan's hybrid is the first chestnut to ever receive a US plant patent. These chestnuts are a profitable orchard crop, bearing in only 3-5 years, and producing 2000-4000 lbs./acre (Wallace 1994). Chestnuts ripen September-October and are sold during the holiday season. In Florida, Dunstan's hybrid has previously not been observed with symptoms of chestnut blight; however, in June 1995, a sample of foliage of Dunstan's *C. dentata* x *C. mollissima* with leaf spots (Fig. 1) was submitted to the Division of Plant Industry's Plant Pathology Section for diagnosis.

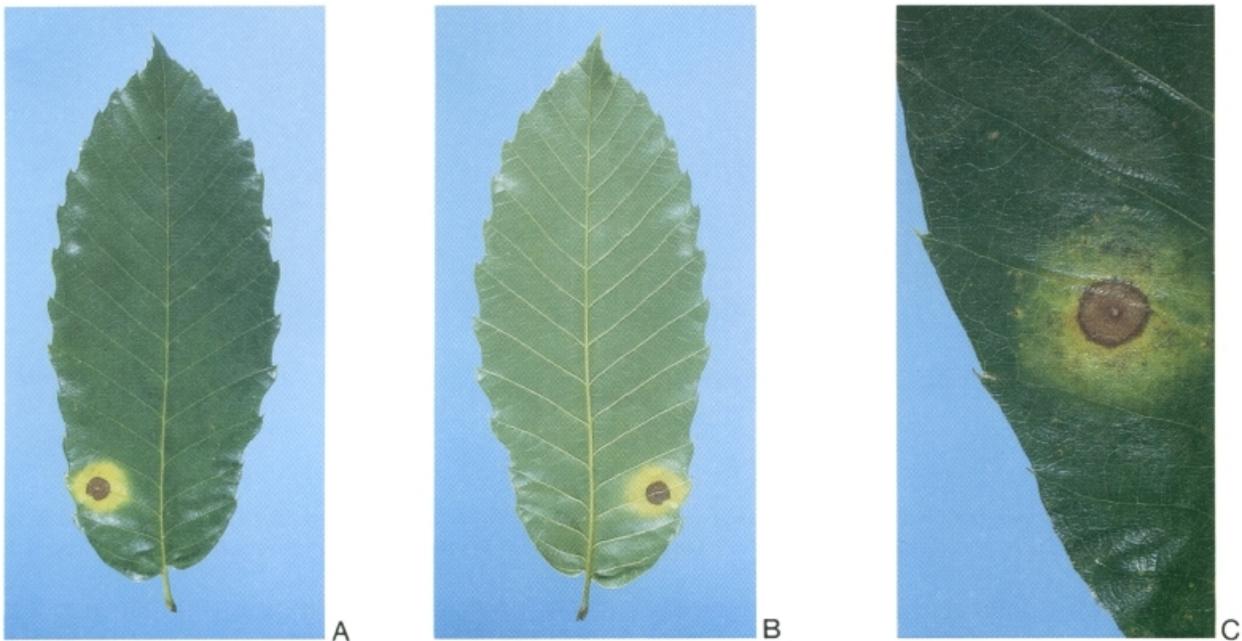


Fig. 1. Leaf spot on upper (A) and corresponding lower (B) surface of *Castanea dentata* x *Castanea mollissima* with a prominent circular chlorotic halo. X 0.45 (C) Close-up of a spot on the upper leaf surface showing a diffused chlorotic halo. Note the two dark concentric rings and the tan center in the necrotic area. Photography credit: Jeffrey W. Lotz (DPI #95021).

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2 Plant Pathologists, FDACS, Division of Plant Industry, P. O. Box 147100, Gainesville, FL 32614-7100.

3 Environmental Specialist, FDACS, Division of Plant Industry, P. O. Box 147100, Gainesville, FL. 32614-7100.

CAUSAL AGENT AND DISTRIBUTION: *Tubakia dryina* (Sacc.) Sutton (Fig. 2) was sporulating in the leafspot (upper surface) of the submitted specimen. The most striking feature of *T. dryina* [syn. *Actinopelte dryina* (Sacc.) Hohnel] is the pycnothyrium. This unique asexual fruiting structure (conidioma) consists of a circular scutellum (shield) attached to the leaf by a central columella (stalk) (Glawe and Crane 1987; Proffer 1990). The sexual state of *T. dryina* is *Dicarpella dryina* Belisario & Barr (Belisario 1991). Microscopic examinations and measurements were made at 400X on 100 scutella. They were (47.3-) 90.9 (-119.5) μm (Min.-)Mean(-Max.) in diameter. Seventy seven conidia measured at 1000X ranged in dimensions as follows: (9.4-)11.5(-15.8) μm in length and (6.9-)8.0(-8.9) μm in width. These measurements are not listed in the literature; we provide them as a reference. In every other respect, the fungus from chestnut matches the published description of *T. dryina*. This distinct fungus is probably distributed worldwide, but in the United States it has been reported primarily east of the Mississippi River (Munkvold and Neely 1990). *T. dryina* has also been associated with leaf spots of oak (*Quercus* spp.) and trees of other genera (Alfieri *et al.* 1994; Farr *et al.* 1989; Glawe and Crane 1987; Hepting 1971; Munkvold and Neely 1990). Inoculations in the field and laboratory confirmed the pathogenicity of *T. dryina* from oak to oak and from *Castanea pubinervis* (Hassk.) C. K. Schn. to oak (Munkvold and Neely 1990). This circular is the first report of *Tubakia* leaf spot on *C. dentata x C. mollissima*.

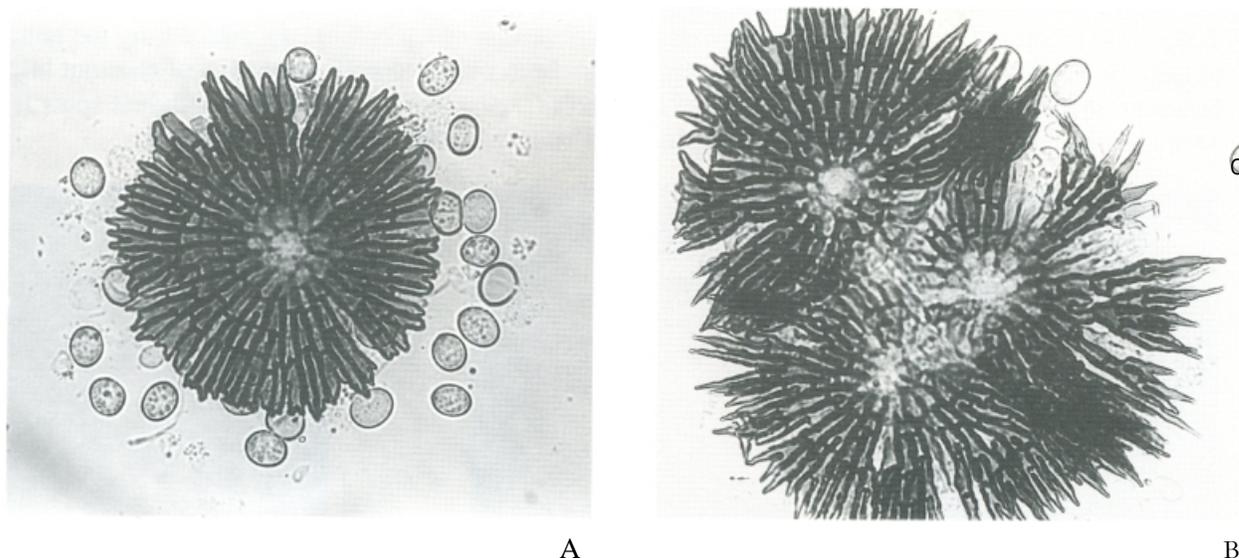


Fig. 2. *Tubakia dryina* from leaf spots on *Castanea dentata x Castanea mollissima*. (A) Pycnothyrium and one-celled conidia. X 536. (B) Coalescing shield-shaped scutella. Note the radiate pattern of the thick-walled hyphae and the pointed tips. X 536.

SYMPTOMS: Infections by *T. dryina* typically result in brown necrotic leaf spots (Fig. 1), up to 9 mm in diameter. Each spot has two dark concentric rings in the necrotic area and a tan center, up to 1 mm in diameter. The lesions are surrounded by a prominent chlorotic halo which is up to 6 mm wide.

CONTROL: Mild cases generally do not warrant controls. In severe cases, mancozeb may be used only on nonbearing trees (Simone *et al.* 1994-95).

SURVEY AND DETECTION: Look for brown necrotic spots surrounded by a prominent chlorotic halo. Examine the necrotic area for the very small pycnothyria (asexual fruiting structures). A hand lens is necessary to see pycnothyria.

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